§ 177.1211 Cross-linked polyacrylate copolymers.

Cross-linked polyacrylate copolymers identified in paragraph (a) of this section may be safely used as articles or components of articles intended for use in contact with food in accordance with the following prescribed conditions:

(a) Identity. For the purpose of this section, the cross-linked polyacrylate copolymers consist of:

(1) The grafted copolymer of cross-linked sodium polyacrylate identified as 2-propenoic acid, polymers with N,N-di-2-propenyl-2-propen-1-amine and hydrolyzed polyvinyl acetate, sodium salts, graft (CAS Reg. No. 166164–74–5); or

(2) 2-propenoic acid, polymer with 2-ethyl-2-(((1-oxo-2-propenyl)oxy)methyl)-1,3-propanediyl di-2-propenoate and sodium 2-propenoate (CAS Reg. No. 76774–25–9).

(b) Adjuvants. The copolymers identified in paragraph (a) of this section may contain optional adjuvant substances required in the production of such copolymers. The optional adjuvant substances may include substances permitted for such use by regulations in parts 170 through 179 of this chapter, substances generally recognized as safe in food, and substances used in accordance with a prior sanction or approval.

(c) Extractives limitations. The copolymers identified in paragraph (a) of this section, in the finished form in which they will contact food, must yield low molecular weight (less than 1,000 Daltons) extractives of no more than 0.15 percent by weight of the total polymer when extracted with 0.2 percent by weight of aqueous sodium chloride solution at 20 °C for 24 hours. The low molecular weight extractives shall be determined using size exclusion chromatography or an equivalent method. When conducting the extraction test, the copolymer, with no other absorptive media, shall be confined either in

<table>
<thead>
<tr>
<th>Conditions of use</th>
<th>Types of food (see table 3)</th>
<th>Extractant</th>
<th>Water</th>
<th>Heptane</th>
<th>8 percent alcohol</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. High temperature heat-sterilized (e.g., over 212 °F)</td>
<td>I, IV-B, VII .......</td>
<td>250 °F, 2 hr ....</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Boiling water-sterilized</td>
<td>II, IV-A, VII .......</td>
<td>212 °F, 30 min ....</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Hot filled or pasteurized above 150 °F</td>
<td>II, IV-B, VI-B .......</td>
<td>150 °F, 2 hr ....</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Hot filled or pasteurized below 150 °F</td>
<td>II, IV-A, VI-A .......</td>
<td>120 °F, 30 min ....</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Temperature filled and stored (no thermal treatment in the container)</td>
<td>II, IV-A, VII .......</td>
<td>120 °F, 24 hr ....</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Refrigerated storage (no thermal treatment)</td>
<td>II, IV-A, VI-A .......</td>
<td>70 °F, 48 hr ....</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Frozen storage (no thermal treatment in the container)</td>
<td>II, IV-A, VI-A .......</td>
<td>70 °F, 24 hr ....</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Heptane extractant not applicable to closure-sealing gaskets overcoated with wax.
2 Time and temperature.

§ 177.1240 1,4-Cyclohexylene
dimethylene terephthalate and 1,4-
cyclohexylene dimethylene
isophthalate copolymer.

Copolymer of 1,4-cyclohexylene
dimethylene terephthalate and 1,4-
cyclohexylene dimethylene isophtha-
late may be safely used as an article or
component of articles used in pro-
ducing, manufacturing, packing, proc-
essing, preparing, treating, packaging,
transporting, or holding food, subject
to the provisions of this section:

(a) The copolymer is a basic poly-
ester produced by the catalytic con-
densation of dimethyl terephthalate
and dimethyl isophthalate with 1,4-
cyclohexanediethanol, to which may
have been added certain optional sub-
stances required in its production or
added to impart desired physical and
technical properties.

(b) The quantity of any optional sub-
stance employed in the production of
the copolymer does not exceed the
amount reasonably required to accom-
plish the intended physical or technical
effect or any limitation further pro-
vided.

(c) Any substance employed in the
production of the copolymer that is the
subject of a regulation in parts 174, 175,
176, 177, 178 and § 179.45 of this chapter
conforms with any specification in
such regulation.

(d) Substances employed in the pro-
duction of the copolymer include:

(1) Substances generally recognized
as safe in food.

(2) Substances subject to prior sanc-
tion or approval for use in the copoly-
mer and used in accordance with such
sanction or approval.

(3) Substances which by regulation in
parts 174, 175, 176, 177, 178 and § 179.45 of
this chapter may be safely used as
components of resinous or polymeric
coatings and film used as food-contact
surfaces, subject to the provisions of
such regulation.

(e) The copolymer conforms with the
following specifications:

(1) The copolymer, when extracted
with distilled water at reflux tempera-
ture for 2 hours, yields total extrac-
tives not to exceed 0.05 percent.

(2) The copolymer, when extracted
with ethyl acetate at reflux tempera-
ture for 2 hours, yields total extrac-
tives not to exceed 0.7 percent.

(3) The copolymer, when extracted
with n-hexane at reflux temperature
for 2 hours, yields total extractives not
to exceed 0.05 percent.

[42 FR 14572, Mar. 15, 1977; 49 FR 5748, Feb. 15,
1984, as amended at 55 FR 34555, Aug. 23, 1990]

§ 177.1310 Ethylene-acrylic acid co-
polymers.

The ethylene-acrylic acid copolymers
identified in paragraph (a) of this sec-
tion may be safely used as components
of articles intended for use in contact
with food subject to the provisions of
this section.

(a) The ethylene-acrylic acid copoly-
mers consist of basic copolymers pro-
duced by the copolymerization of
ethylene and acrylic acid such that the
finished basic copolymers contain no
more than:

(1) 10 weight-percent of total polymer
units derived from acrylic acid when
used in accordance with paragraph (b)
of this section; and

(2) 25 weight-percent of total polymer
units derived from acrylic acid when
used in accordance with paragraph (c)
of this section.

(b) The finished food-contact articles
made with no more than 10 percent
total polymer units derived from acryl-
ic acid, when extracted with the sol-
vent or solvents characterizing the